

## IN THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

- 1           1.       (Currently Amended) A program storage device readable by a computer,  
2       the program storage device medium tangibly embodying one or more programs of  
3       instructions executable by the computer to perform a method for determining a size of a  
4       last data block processed in a storage system , the method comprising:  
5           detecting ~~a characteristic of a data channel gate signal indicating a length of data;~~  
6           initiating a counter for counting to a predetermined count upon detection of the  
7       gate signal;  
8           resetting the counter each time the predetermined count is reached;  
9           deasserting the gate signal a programmable length before the end of the last data  
10       byte;  
11           stopping the counter upon deassertion of the gate signal; and  
12           ~~determining the length of data based on the detection of the characteristic; and~~  
13           calculating a size of a last data block ~~in the length of data based on the determined~~  
14       length according to a remainder in the counter after the counter is stopped.

- 1           2.       (Original)     The program storage device of claim 1, wherein the  
2       detecting the characteristic of the data channel gate signal further comprises detecting a  
3       transition of a read-gate signal and a write-gate signal for indicating the last data block in  
4       the length of data.

1           3.       (Original)     The program storage device of claim 2, wherein the  
2     detecting the transition of the write-gate signal further comprises detecting a de-assertion  
3     of write-gate signal  $M1$  bytes before the end of a data sector being written to provide the  
4     size of the last data block ( $R$ ), the size of the last data block ( $R$ ) equals  $\text{MOD}(K+M1, L)$ ,  
5     wherein  $K$  is a determined length count number,  $K+M1$  equals the sector size  $N$  and  $L$   
6     equals a codeword size.

1           4.       (Original)     The program storage device of claim 2, wherein the  
2     detecting the transition of the read-gate signal further comprises detecting a de-assertion  
3     of read-gate signal  $M2$  bytes before the end of a data sector being read to provide the size  
4     of the last data block ( $R$ ), the size of the last data block ( $R$ ) equals  $\text{MOD}(K+M2, L)$ ,  
5     wherein  $K$  is a determined length count number,  $K+M2$  equals the sector size  $N$  and  $L$   
6     equals a codeword size.

1           5.       (Original)     The program storage device of claim 2 further comprising  
2     decoding the last data block after reading the last data block from a medium.

1           6.       (Original)     The program storage device of claim 5, wherein the  
2     decoding the last data block further comprises using parity post-processing and run-  
3     length-limited decoding schemes.

1           7.       (Original)     The program storage device of claim 1, wherein the  
2     calculating the size of a last data block further comprises calculating a modulo (MOD) of  
3     sector size ( $N$ ) and codeword size ( $L$ ) to provide the size of the last data block ( $R$ ),  
4     wherein the size of the last data block ( $R$ ) equals  $\text{MOD}(N, L)$ .

1           8.       (Original)     The program storage device of claim 1 further comprising  
2     encoding the last data block before writing the last data block to a medium.

1           9.       (Original)     The program storage device of claim 8, wherein the  
2     encoding the last data block further comprises using parity and run-length-limited  
3     encoding schemes.

1           10.      (Original)     The program storage device of claim 1 further comprising  
2     applying parity encoding/decoding on the last data block without padding additional  
3     bytes.

1           11.     (Currently Amended) A read/write channel device comprising:  
2           a signal processor for detecting ~~a characteristic of~~ a data channel gate signal  
3     ~~indicating a length of data~~ the gate signal being deasserted a programmable length before  
4     the end of the last data byte; and  
5           a counter ~~for determining the length of the data based on the detection of the~~  
6     ~~characteristic~~ for counting to a predetermined count upon detection of the gate signal, the  
7     counter being reset each time the predetermined count is reached and stopped upon  
8     deassertion of the gate signal; the counter providing a ~~and for calculating the size of a last~~  
9     data block in the length of data ~~based on the determined length~~ according to a remainder  
10    in the counter after the counter is stopped.

1           12.     (Original)     The read/write channel device of claim 11, wherein the  
2     signal processor further comprises a read-gate and a write-gate for indicating the last data  
3     block in the length of data.

1           13.     (Original)     The read/write channel device of claim 12, wherein the  
2     write-gate provides a signal  $Ml$  bytes before the end of a data sector being written to  
3     provide the size of the last data block ( $R$ ), the size of the last data block ( $R$ ) equals  $\text{MOD}$   
4      $(K+Ml, L)$ , wherein  $K+Ml$  equals the sector size  $N$  and  $L$  equals a codeword size.

1           14.   (Original)   The read/write channel device of claim 12, wherein the  
2 read-gate provides a signal  $M2$  bytes before the end of a data sector being read to provide  
3 the size of the last data block ( $R$ ), the size of the last data block ( $R$ ) equals  $\text{MOD}(K + M2,$   
4  $L)$ , wherein  $K + M2$  equals the sector size  $N$  and  $L$  equals a codeword size.

1           15.   (Original)   The read/write channel device of claim 11 further  
2 comprising a decoder for decoding the last data block after reading the last data block  
3 from a medium.

1           16.   (Original)   The read/write channel device of claim 15, wherein the  
2 decoder further comprises a post-processor for providing parity post-processing and a  
3 channel decoder for providing run-length-limited decoding schemes.

1           17.   (Original)   The read/write channel device of claim 11, wherein the  
2 counter calculates a modulo ( $\text{MOD}$ ) of sector size ( $N$ ) and codeword size ( $L$ ) to provide  
3 the size of the last data block ( $R$ ), wherein the size of the last data block ( $R$ ) equals  $\text{MOD}$   
4 ( $N, L$ ).

1           18.   (Original)   The read/write channel device of claim 11 further  
2 comprising an encoder for encoding the last data block before writing the last data block  
3 to a medium.

1           19.    (Original)    The read/write channel device of claim 18, wherein the  
2   encoder further comprises a channel encoder and a parity encoder for providing parity  
3   and run-length-limited processing.

1           20.    (Original)    The read/write channel device of claim 11 further  
2   comprising an encoder/decoder for applying parity on the last data block without padding  
3   additional bytes.

1           21.     (Currently Amended) A storage system for determining sector block sizes  
2     using existing controller signals, comprising:

3                 a storage medium for storing data thereon, the storage medium formatted for a  
4     predetermined sector length;

5                 a transducer, operatively coupled to the storage medium, for reading and writing  
6     data on the storage medium; and

7                 a read/write channel device for determining a size of a last data block, comprising

8                         a signal processor for detecting ~~a characteristic of~~ a data channel gate

9     signal ~~indicating a length of data~~ the gate signal being deasserted a programmable length

10    before the end of the last data byte; and

11                         a counter to ~~determine the length of the data based on the detection of the~~

12    ~~characteristic~~ for counting to a predetermined count upon detection of the gate signal, the

13    counter being reset each time the predetermined count is reached and stopped upon

14    deassertion of the gate signal; the counter providing a ~~and to calculate the size of the a~~

15    last data block in the length of data ~~based on the determined length~~ according to a

16    remainder in the counter after the counter is stopped.

1           22.     (Original)     The storage system of claim 21 further comprising a

2     storage controller for generating both a write-gate signal and a read-gate signal to the

3     read/write channel, and for generating NRZ data to read/write channel for writing and for

4     receiving NRZ data from read/write channel for reading.

1           23.    (Original)    The storage system of claim 21, wherein the signal  
2   processor further comprises a write-gate and a read-gate for indicating the last data block  
3   in the length of data.

1           24.    (Original)    The storage system of claim 23, wherein the write-gate  
2   provides a signal  $M1$  bytes before the end of a data sector being written to provide the  
3   size of the last data block ( $R$ ), the size of the last data block ( $R$ ) equals  $\text{MOD}(K + M1, L)$ ,  
4   wherein  $K + M1$  equals the sector size and  $L$  equals a codeword size.

1           25.    (Original)    The storage system of claim 23, wherein the read-gate  
2   provides a signal  $M2$  bytes before the end of a data sector being read to provide the size  
3   of the last data block ( $R$ ), the size of the last data block ( $R$ ) equals  $\text{MOD}(K + M2, L)$ ,  
4   wherein  $K + M2$  equals the sector size and  $L$  equals a codeword size.

1           26.    (Original)    The storage system of claim 21 further comprising a  
2   decoder for decoding the last data block after reading the last data block from a medium.

1           27.    (Original)    The storage system of claim 26, wherein the decoder  
2   further comprises a post-processor for providing parity post-processing and a channel  
3   decoder for providing run-length-limited decoding schemes.

1           28.    (Original)    The storage system of claim 21, wherein the counter  
2   calculates a modulo ( $\text{MOD}$ ) of sector size ( $N$ ) and codeword size ( $L$ ) to provide the size  
3   of the last data block ( $R$ ), wherein the size of the last data block ( $R$ ) equals  $\text{MOD}(N, L)$ .



1           29.    (Original)    The storage system of claim 21 further comprising an  
2   encoder for encoding the last data block before writing the last data block to a medium.

1           30.    (Original)    The storage system of claim 29, wherein the encoder  
2   further comprises a channel encoder and a parity encoder for providing parity and run-  
3   length-limited processing.

- 1           31.     (Currently Amended) A means for determining the size of a last data  
2     block processed in a storage system comprising:
- 3           ~~means for detecting a characteristic of a data channel gate signal indicating a~~  
4     ~~length of data;~~
- 5           ~~means for determining the length of data based on the detection of the~~  
6     ~~characteristic; and~~
- 7           ~~means for calculating the size of a last data block in the length of data based on~~  
8     ~~the determined length~~
- 9           means for detecting a data channel gate signal;
- 10          means for initiating a counter for counting to a predetermined count upon  
11     detection of the gate signal;
- 12          means for resetting the counter each time the predetermined count is reached;
- 13          means for deasserting the gate signal a programmable length before the end of the  
14     last data byte;
- 15          means for stopping the counter upon deassertion of the gate signal; and
- 16          means for calculating a size of a last data block according to a remainder in the  
17     counter after the counter is stopped.

1           32.   (Currently Amended) A method of determining a size of a last data block  
2   processed in a storage system comprising:  
3       ~~detecting a characteristic of a data channel gate signal indicating a length of data;~~  
4       ~~determining the length of data based on the detection of the characteristic; and~~  
5       ~~calculating a size of a last data block in the length of data based on the determined~~  
6   ~~length~~  
7       detecting a data channel gate signal;  
8       initiating a counter for counting to a predetermined count upon detection of the  
9   gate signal;  
10      resetting the counter each time the predetermined count is reached;  
11      deasserting the gate signal a programmable length before the end of the last data  
12   byte;  
13      stopping the counter upon deassertion of the gate signal; and  
14      calculating a size of a last data block according to a remainder in the counter after  
15   the counter is stopped.